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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,474	03/03/2005	Koji Tatsumi	OHA-008	1863

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KANESAKA BERNER AND PARTNERS LLP
1700 DIAGONAL RD
SUITE 310
ALEXANDRIA, VA 22314-2848

EXAMINER	
LEWIS, BEN	
ART UNIT	**PAPER NUMBER**
1795	
MAIL DATE	**DELIVERY MODE**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,474	TATSUMI ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 8-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 8-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 31st, 2007 has been entered. Claims 1,9 and 10 have been amended. Claims 4-7 were cancelled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Biensan et al. (U.S. Patent No. 6,071,645)

With respect to claims 1,3 and 10, Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell (title) wherein, the electrode for a rechargeable lithium cell, contains an electro-chemically active material with general formula $Li_x M_y A_m D_z O_t$, $0.8<=x<=1.2$; $0.8<=t<=4.2$; $(0.8-m-z)<=y<=(2.2-m-z)$; $0<=z<=0.3$; $0<m<=0.3$; where M is at least one transition metal selected from nickel, cobalt, manganese, and iron, A is selected from magnesium and calcium, and D (element B) is at least one element selected from the elements of groups 4b to 5a of the periodic classification. In the formula, Li represents lithium and O is oxygen. The term "element from groups 4b to 5a of the periodic classification" (HANDBOOK of CHEMISTRY and PHYSICS, 46.sup.the Edition) means the elements from Ti, Zr, etc "group IV transition element". . . , to Sb, Bi. D (element B) is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Doping elements D substitute for a portion of the transition metal which defines the structure of the material (Col 1 lines 35-67).

With respect to element B being 20% or less, it is noted that $0<=z<=0.3$, therefore D (element B) can be between 0 and 30 mole %.

With respect to diffraction characteristics, the instant specification recites: a positive electrode for a secondary lithium-ion cell having high cycle durability and high safety in high-voltage and high-capacity applications, which is a particulate positive electrode active material for a secondary lithium-ion cell represented by a general formula, $Li_aCO_bA_cB_d O_e F_f$ (A is Al or Mg, B is a group-IV transition element, 0.90. <=a <=1.10, 0.97<=b<=1.00, 0.0001<=c<=0.03, 0.0001<=d<=0.03, 1.98<=e<=2.02,

0<=f<=0.02, and 0.0001<=c+d<=0.03), where element A, element B and fluorine are evenly present in the vicinity of the particle surfaces (See Abstract).

Biensan et al. do not disclose any X-ray diffraction data. However, it is the position of the examiner that such properties are inherent, given that Beinsan et al and the present application utilize the same electrode active material comprising the same elements. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 2, Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell (title) wherein, the electrode for a rechargeable lithium cell, contains an electro-chemically active material with general formula $Li_x M_y A_m D_z O_t$, 0.8<=x<=1.2; 0.8<=t<=4.2; (0.8-m-z)<=y<=(2.2-m-z); 0<=z<=0.3; 0<m<=0.3; where M is at least one transition metal selected from nickel, cobalt, manganese, and iron, A is selected from magnesium and calcium, and D (element B) is at least one element selected from the elements of groups 4b to 5a of the periodic classification. In the formula, Li represents lithium and O is oxygen. Biensan et al. also teach that D (element B) is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Doping elements D substitute for a portion of the transition metal which defines the structure of the material (Col 1 lines 35-67).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biensan et al. (U.S. Patent No. 6,071,645) in view of Naruoka et al. (U.S. Pub No. 2002/0086210 A1).

With respect to claim 8, Biensan et al disclose a positive electrode active material in paragraph 2 above.

Biensan et al do not specifically disclose the average particle diameter of the positive active material. However Narouka et al. disclose a positive active material for non aqueous electrolyte secondary battery (title) wherein, The positive active material preferably has a mean particle diameter D_{50} of from 4μm to 25μm and a BET specific surface area of from 0.2 to 1.5 m^2/g (Paragraph 0026). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the same particle size of Narouka et al. for the particle size of the positive electrode active material of Biensan et al. because Narouka et al. teach that by using a lithium-nickel

composite oxide having a mean particle diameter D_{50} of from 4μm to 25μm as a positive active material, the capacity density can be kept high (Paragraph 0023).

With respect to the particles being formed by coagulation of 10 or more primary particles, Biensan et al. as modified by Narouka et al. do not specifically teach particle coagulation. However, it is the position of the examiner that such properties are inherent, given that Biensan et al. as modified by Narouka et al. and the present application utilize the same electrode active material comprising the same elements of the same particle size. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biensan et al. (U.S. Patent No. 6,071,645) in view of Naruoka et al. (U.S. Pub No. 2002/0086210 A1).

With respect to claim 9, Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell (title) wherein, the electrode for a rechargeable lithium cell, contains an electro-chemically active material with general formula $Li_x M_y A_m D_z O_t$, $0.8<=x<=1.2$; $0.8<=t<=4.2$; $(0.8-m-z)<=y<=(2.2-m-z)$; $0<=z<=0.3$; $0<m<=0.3$; where M is at least one transition metal selected from nickel, cobalt, manganese, and iron, A is selected from magnesium and calcium, and D (element B) is at least one element selected from the elements of groups 4b to 5a of the periodic classification. In the formula, Li represents lithium and O is oxygen. The term "element from groups 4b

to 5a of the periodic classification" (HANDBOOK of CHEMISTRY and PHYSICS, 46.sup.the Edition) means the elements from Ti, Zr, etc "group IV transition element". . . , to Sb, Bi. D (element B) is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Doping elements D substitute for a portion of the transition metal which defines the structure of the material (Col 1 lines 35-67).

Biensan et al do not specifically disclose the average particle diameter of the positive active material. However Narouka et al. disclose a positive active material for non aqueous electrolyte secondary battery (title) wherein, The positive active material preferably has a mean particle diameter D_{50} of from 4μm to 25μm and a BET specific surface area of from 0.2 to 1.5 m^2/g (Paragraph 0026). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the same particle size of Narouka et al. for the particle size of the positive electrode active material of Biensan et al. because Narouka et al. teach that by using a lithium-nickel composite oxide having a mean particle diameter D_{50} of from 4μm to 25μm as a positive active material, the capacity density can be kept high (Paragraph 0023).

With respect to the preparation of the positive active material, Biensan et al teach that the present invention also provides a process for the production of an electrochemically active material for use in an electrode of a rechargeable lithium cell. The process comprises the following steps: forming a mixture comprising at least one lithium compound and at least one oxygen-containing compound of at least one transition metal M and of an element A selected from magnesium and calcium; grinding

the mixture, then heat treating it in an oxidizing atmosphere, for example in air or oxygen (Col 2 lines 14-25).

With respect to cobalt raw material, Biensan et al teach that the process comprises the following steps: forming a mixture comprising at least one lithium compound and at least one oxygen-containing compound of at least one transition metal M (cobalt). Biensan et al. teach that preferably, said oxygen containing compound is selected from an oxide, a hydroxide, an oxyhydroxide and mixtures thereof (Col 2 lines 27-30).

With respect to lithium carbonate, Biensan et al teach that, the lithium compound is preferably selected from lithium hydroxide, lithium carbonate, lithium nitrate, lithium oxide, and mixtures thereof (Col 2 lines 27-30).

With respect to the particles being formed by coagulation of 10 or more primary particles, Biensan et al. as modified by Narouka et al. do not specifically teach particle coagulation. However, it is the position of the examiner that such properties are inherent, given that Biensan et al. as modified by Narouka et al. and the present application utilize the same electrode active material comprising the same elements of the same particle size. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to Applicant's claimed heat treatment range. Applicant's specification teaches that "A mixture of these source materials, preferably a mixture of at least one selected from an oxide containing the element A or B and a hydroxide

containing the element A or B, lithium fluoride, cobalt hydroxide, cobalt oxyhydroxide or cobalt oxide, and lithium carbonate is fired in an oxygen-containing atmosphere at 600 to 1050 °C, preferably at 850 to 1000 °C. for preferably 4 to 48 hours, more preferably for 8 to 20 hours to convert to a composite oxide" (Paragraph 0048).

Biensan et al. teach that the heat treatment is preferably carried out at a temperature in the range 600 °C to 750 °C for a period in the range 2 hours to 20 hours. Biensan et al. do not specifically teach a heat treatment temperature in the range as claimed by Applicant. However, it would have been within one of ordinary skill in the art to adjust the heat treatment temperature of Beinsan et al. to be within Applicant's claimed heat treatment range since there is no showing of unexpected results or showing of criticality of the heat treatment range as claimed by the Applicant in contrast to the heat treatment range disclosed by Beinsan et al.

Response to Arguments

5. Applicant's arguments filed on October 31st, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) In the invention, when cobalt, lithium, magnesium and zirconium raw materials are mixed and fired at 850-1000 °C, the positive electrode having the element B limited to 20% or less where no diffraction peaks are observed at 28 of 28±1° in a high-sensitivity X-ray diffraction spectrum using Cu-K~ ray, is obtained. The positive electrode thus obtained shows excellent charge-discharge cycle durability and high discharge capacity. The cited references in the Action do not disclose or suggest the features now defined in the claims.

In response to Applicant's arguments, please consider the following comments:

(a) With respect to diffraction characteristics, the instant specification recites: a positive electrode for a secondary lithium-ion cell having high cycle durability and high safety in high-voltage and high-capacity applications, which is a particulate positive electrode active material for a secondary lithium-ion cell represented by a general formula, $Li_aCO_bA_cB_d O_e F_f$ (A is Al or Mg, B is a group-IV transition element, 0.90.ltoreq.a.ltoreq.1.10, 0.97<=b<=1.00, 0.0001<=c<=0.03, 0.0001<=d<=0.03, 1.98<=e<=2.02, 0<=f<=0.02, and 0.0001<=c+d<=0.03), where element A, element B and fluorine are evenly present in the vicinity of the particle surfaces (See Abstract).

Biensan et al. do not disclose any X-ray diffraction data. However, it is the position of the examiner that such properties are inherent, given that Beinsan et al and the present application utilize the same electrode active material comprising the same elements. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Applicant's specification teaches that "A mixture of these source materials, preferably a mixture of at least one selected from an oxide containing the element A or B and a hydroxide containing the element A or B, lithium fluoride, cobalt hydroxide, cobalt oxyhydroxide or cobalt oxide, and lithium carbonate is fired in an oxygen-containing atmosphere at 600 to 1050 °C, preferably at 850 to 1000 °C. for preferably 4 to 48 hours, more preferably for 8 to 20 hours to convert to a composite oxide" (Paragraph 0048).

Biensan et al. teach that the heat treatment is preferably carried out at a temperature in the range 600 °C to 750 °C for a period in the range 2 hours to 20 hours. Biensan et al. do not specifically teach a heat treatment temperature in the range as claimed by Applicant. However, it would have been within one of ordinary skill in the art to adjust the heat treatment temperature of Beinsan et al. to be within Applicant's claimed heat treatment range since there is no showing of unexpected results or showing of criticality of the heat treatment range as claimed by the Applicant in contrast to the heat treatment range disclosed by Beinsan et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Patent Examiner
Art Unit 1745